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# OHIO FARM MACHINERY ECONOMIC COST ESTIMATES FOR 2000

**Revised and Adapted for Ohio***

by
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# Ohio Farm Machinery Economic Cost Estimates for 2000

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The tables in this publication estimate farm machinery operations or function costs for early 2000. The estimates use an economic engineering approach. The data represent average farming industry costs for specified machines and operations. A diesel fuel price of $1.10 per gallon is used, up from 70 cents used in the 1999 publication. Other parameters remain at 1999 levels.

Machine costs are separated into time and use-related categories. Overhead costs accrue to the owner whether or not a machine is used. Overhead includes time-related economic costs: interest, insurance and housing. There are no personal property taxes in Ohio. Operating costs occur only when a machine is used. They include fuel, lubrication, use-related repairs, and labor. Depreciation is also usually considered a time-related cost. Depreciation may also be related to use to the extent that more usage shortens life and reduces salvage value.

OVERHEAD COSTS: Time-related costs are prorated over a 12-year economic life. Trade-in values are estimated based on American Society of Agricultural Engineers formulas.

Purchase prices are discounted from manufacturers' list prices. A 10 percent discount off list price appears "normal." The tables include some adjustment for delivery and setup. An equivalent price adjustment for the income tax expensing option is not included. A housing charge on average investment of 33 cents per square foot of shelter space needed per year is made.

A six percent "real" (inflation-adjusted) interest rate is used in the cost estimates. This real rate is calculated by taking a nominal rate charged by lenders, minus a measure of the inflation rate per year expected over the years of ownership. Insurance is 0.85 percent of new cost. The interest and insurance cost formulas are slightly different from those used in previous years. Adding one year's depreciation to the numerator in effect bases the costs on the value at the beginning of each year owned. This gives a slightly more accurate calculation of the actual costs over the years owned. In states where farm machinery is taxed as personal property, property tax could be calculated in a similar manner, depending on how taxes are assessed.

Formulas used to compute machinery overhead costs ($ per year):

$$\text{Depreciation} = \frac{\text{Purchase cost - salvage value}}{\text{Years you will use machine}}$$

$$\text{Interest} = \frac{\text{purchase cost + salvage value + annual depreciation}}{2} \times \text{"real" interest rate}$$

$$\text{Insurance} = \frac{\text{purchase cost + salvage value + annual depreciation}}{2} \times \text{insurance rate}$$

$$\text{Housing} = \text{price per sq. foot} \times \text{sq. feet shelter space required}$$

OPERATING COSTS: Fuel cost is calculated by multiplying the fuel consumption by the price of fuel, with fuel consumption assumed to be 0.044 gallons of diesel fuel per horsepower hour. The price of diesel fuel is projected at $1.40 per gallon. All power units, tractors, combines, trucks, etc., are assumed to use diesel fuel. Lubrication cost is assumed to be 15 percent of fuel cost.

The formulas for repair and maintenance costs estimate total accumulated repair costs according to the accumulated hours of life-time use.

Repair and maintenance calculations are based on American Society of Agricultural Engineers (ASAE) formulas. The total cost is then divided by accumulated hours to arrive at an average per hour cost estimate. The amount of annual use of a machine is an estimate of the number of hours a commercial farmer would use that particular machine in one year.

Labor is not included in the "operating expense" column since it is shown separately. Labor is charged at an hourly wage rate, which includes a 30 percent factor for benefits. Charge rates are $9.50 per hour for unskilled labor and $12.00 per hour for skilled labor. Skilled labor is generally associated with the planting and harvesting equipment and sprayers. Labor per acre for an operation such as plowing and disking is calculated by using the work rate on the implement. Less labor per acre is used in a disking operation that covers more acres per hour than in a plowing operation. A small amount of extra labor is added over and above machine time to allow for downtime for tasks such as making adjustments and filling sprayers and planters. The labor adjustment ranges from 2 percent additional time for tillage to 33 percent for spraying.

These estimates will not represent any given individual's cost. They should not take the place of accurate record-keeping. They can still be used to help plan the cropping operation if more specific data are not available. Differences in buying power, repair programs, average annual use and overall replacement programs should be considered when making adjustments.

Machinery costs are substantial; control of them is important. Custom charges are often based upon them. No one should do custom work unless the charge will cover operating costs and use-related depreciation plus a return for one's risk and time. Ideally, all allocated per acre or hour overhead costs should also be covered by anyone offering to do custom work. The market for custom work usually does not cover all costs. The market is usually somewhere between the operating costs and the total of operating plus allocated per acre or hour overhead costs and depreciation.

Tables 1-6 provide the 2000 machinery function costs broken down into several categories. Some relevant supporting data also are included. A spreadsheet template is also available for downloading from the Department of Applied Economics, University of Minnesota, WWW site, for use in analyzing specific situations or just to better understand the methods used to calculate the numbers. The address is: http://apecon.agri.umn.edu/crop.html.

This specific OSU publication is available on the web in PDF (Adobe Acrobat) format under 2000 Farm Machinery Costs at:

http://www-agecon.ag.ohio-state.edu/Faculty/edit/faculty.cfm?FacultyID=15

**Tables:**

**Table 1. Tractors & Combines (Without Heads) Economic Cost for 2000**

| Tractor or Combine HP | Net Cost of the New Power Unit | Annual Hours of Use | — Overhead[1] — Cost per Year | Cost per Hour | Deprec-ation per Hour | — Operating[2] — Expense per Hour | Expense per Year | — Total Cost[3] — of Use per Year | of Use per Hour | Maintenance & Repair Cost/Hr. | Diesel Use/Hr. Gallons |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 40 Hp | 20,000 | 400 | 971 | 2.43 | 3.01 | 2.90 | 1,159 | 3,335 | 8.34 | 0.7 | 1.8 |
| 60 Hp | 23,200 | 400 | 1,125 | 2.81 | 3.49 | 4.12 | 1,648 | 4,170 | 10.43 | 0.8 | 2.6 |
| 75 Hp | 27,200 | 400 | 1,329 | 3.32 | 4.01 | 5.14 | 2,055 | 4,987 | 12.47 | 1.0 | 3.3 |
| 105 MFWD | 57,300 | 450 | 2,871 | 6.38 | 6.83 | 6.88 | 3,094 | 9,038 | 20.09 | 1.0 | 4.6 |
| 130 MFWD | 74,900 | 450 | 3,740 | 8.31 | 8.93 | 8.58 | 3,863 | 11,621 | 25.82 | 1.3 | 5.7 |
| 160 MFWD | 91,400 | 500 | 4,383 | 8.77 | 10.90 | 10.73 | 5,367 | 15,200 | 30.40 | 1.8 | 7.0 |
| 200 MFWD | 106,600 | 500 | 5,104 | 10.21 | 12.71 | 13.26 | 6,632 | 18,092 | 36.18 | 2.1 | 8.8 |
| 225 MFWD | 127,300 | 400 | 6,115 | 15.29 | 18.83 | 14.56 | 5,824 | 19,473 | 48.68 | 2.0 | 9.9 |
| 260 4Wd | 98,600 | 400 | 4,755 | 11.89 | 14.59 | 16.05 | 6,420 | 17,010 | 42.53 | 1.6 | 11.4 |
| 310 4Wd | 112,200 | 400 | 5,400 | 13.50 | 16.60 | 19.05 | 7,620 | 19,660 | 49.15 | 1.8 | 13.6 |
| 360 4Wd | 123,400 | 400 | 5,930 | 14.83 | 18.26 | 22.01 | 8,805 | 22,038 | 55.10 | 2.0 | 15.8 |
| 425 4Wd | 147,700 | 400 | 7,082 | 17.71 | 21.85 | 26.02 | 10,407 | 26,231 | 65.58 | 2.4 | 18.7 |
| 225 Tracked | 160,000 | 400 | 7,665 | 19.16 | 23.67 | 15.08 | 6,033 | 23,167 | 57.92 | 2.6 | 9.9 |
| 190 SmComb. | 119,700 | 300 | 5,340 | 17.80 | 27.64 | 31.20 | 9,360 | 22,993 | 76.64 | 20.6 | 8.4 |
| 220 MdComb. | 126,100 | 300 | 5,653 | 18.84 | 29.12 | 33.97 | 10,191 | 24,582 | 81.94 | 21.7 | 9.7 |
| 275 Lg Comb. | 151,700 | 300 | 6,807 | 22.69 | 35.03 | 41.44 | 12,433 | 29,751 | 99.17 | 26.1 | 12.1 |

1) Overhead costs include interest, insurance and housing but not depreciation., which is shown separately because it varies to some extent with use.
2) Operating expenses include fuel, oil, repairs and maintenance but not labor, which is shown separately in the implement tables.
3) Total Cost includes overhead cost, operating cost and depreciation.

**Table 2. Tillage Equipment Economic Cost Structure for 2000**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chisel Plow 11 ft | 75 | 5,200 | 5.87 | 469 | 31.35 | 1.15 | 1.30 | 2.13 | 1.57 | 1.65 | 5.34 | 0.56 |
| Chisel Plow 15 ft | 130 | 6,700 | 8.00 | 640 | 47.22 | 1.33 | 1.70 | 3.23 | 1.46 | 1.21 | 5.90 | 0.72 |
| Chisel Plow 19 ft | 160 | 11,700 | 10.13 | 811 | 59.84 | 1.41 | 1.88 | 3.00 | 1.95 | 0.96 | 5.91 | 0.69 |
| Chisel Plow 23 ft | 200 | 14,700 | 12.27 | 981 | 70.55 | 1.45 | 1.87 | 2.95 | 2.01 | 0.79 | 5.75 | 0.72 |
| Chisel Plow 31 ft | 225 | 18,600 | 16.53 | 1,323 | 89.53 | 1.22 | 1.92 | 2.94 | 1.88 | 0.59 | 5.42 | 0.60 |
| Chisel Plow 37 ft | 310 | 21,200 | 19.73 | 1,579 | 94.47 | 1.29 | 1.59 | 2.49 | 1.81 | 0.49 | 4.79 | 0.69 |
| Chisel Plow 57 ft | 425 | 34,300 | 30.40 | 2,432 | 131.97 | 1.20 | 1.50 | 2.16 | 1.87 | 0.32 | 4.34 | 0.62 |
| Moldboard Plow 4-18, 6 ft | 75 | 10,400 | 2.78 | 334 | 35.88 | 3.46 | 3.17 | 4.48 | 4.93 | 3.48 | 12.90 | 1.19 |
| Moldboard Plow 5-18, 7.5 ft | 105 | 12,800 | 3.48 | 417 | 46.70 | 3.57 | 3.67 | 5.78 | 4.87 | 2.79 | 13.43 | 1.33 |
| Moldboard Plow 6-18, 9 ft | 130 | 15,200 | 4.17 | 542 | 55.02 | 3.73 | 3.70 | 6.19 | 4.68 | 2.32 | 13.19 | 1.37 |
| Moldboard Plow 8-18, 12 ft | 160 | 20,400 | 5.56 | 723 | 66.20 | 3.62 | 3.52 | 5.46 | 4.69 | 1.74 | 11.90 | 1.27 |
| Moldboard Plow 10-18, 15 ft | 260 | 27,300 | 6.95 | 1,043 | 85.63 | 4.33 | 3.55 | 6.11 | 4.81 | 1.39 | 12.31 | 1.64 |
| Reversible Plow 2-18, 3 ft | 60 | 2,400 | 1.39 | 209 | 23.20 | 3.85 | 3.15 | 7.50 | 2.22 | 6.97 | 16.68 | 1.90 |
| Reversible Plow 5-18, 7.5 ft | 160 | 7,100 | 3.48 | 522 | 48.91 | 4.14 | 3.89 | 8.74 | 2.54 | 2.79 | 14.07 | 2.02 |
| Revs. Plow 5-18 HD, 7.5 ft | 160 | 9,900 | 3.48 | 522 | 52.40 | 4.55 | 4.19 | 8.74 | 3.54 | 2.79 | 15.07 | 2.02 |
| Reversible Plow 8-18, 12 ft | 225 | 14,000 | 5.56 | 835 | 75.78 | 3.91 | 4.32 | 8.75 | 3.13 | 1.74 | 13.62 | 1.78 |
| Field Cultivator 12.5 ft | 75 | 5,600 | 9.02 | 1,082 | 29.45 | 0.79 | 0.73 | 1.38 | 0.81 | 1.07 | 3.27 | 0.37 |
| Field Cultivator 18 ft | 105 | 9,000 | 12.98 | 1,558 | 41.26 | 0.77 | 0.85 | 1.55 | 0.89 | 0.75 | 3.18 | 0.36 |
| Field Cultivator 28 ft | 160 | 14,200 | 20.19 | 2,423 | 58.17 | 0.78 | 0.87 | 1.51 | 0.90 | 0.48 | 2.88 | 0.35 |
| Field Cultivator 37 ft | 225 | 20,200 | 26.68 | 3,202 | 83.89 | 0.81 | 1.06 | 1.82 | 0.96 | 0.36 | 3.14 | 0.37 |
| Field Cultivator 47 ft | 260 | 30,200 | 33.90 | 4,068 | 90.02 | 0.78 | 0.84 | 1.25 | 1.12 | 0.29 | 2.66 | 0.34 |
| Field Cultivator 60 ft | 310 | 37,400 | 43.27 | 5,193 | 105.40 | 0.74 | 0.78 | 1.14 | 1.08 | 0.22 | 2.44 | 0.32 |

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**Table 2. Tillage Equipment Economic Cost Structure for 2000 (Continued)**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Deprec-iation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Chisel Plow, Front Disk 8.75 ft | 105 | 9,000 | 4.96 | 397 | 44.37 | 1.74 | 2.76 | 4.05 | 2.94 | 1.95 | 8.95 | 0.93 |
| Chisel Plow, Front Disk 16.25 ft | 200 | 16,100 | 9.21 | 737 | 71.58 | 1.78 | 2.71 | 3.93 | 2.79 | 1.05 | 7.77 | 0.96 |
| Chisel Plow, Front Disk 18.75 ft. fold | 260 | 21,100 | 10.63 | 850 | 85.62 | 1.90 | 2.88 | 4.00 | 3.14 | 0.91 | 8.06 | 1.08 |
| Chisel Plow, Front Disk 21.25 ft fold | 310 | 24,300 | 12.04 | 963 | 97.17 | 1.97 | 2.91 | 4.08 | 3.18 | 0.80 | 8.07 | 1.13 |
| Offset Disk 7 ft | 60 | 5,200 | 3.25 | 325 | 27.16 | 1.63 | 2.05 | 3.21 | 2.17 | 2.99 | 8.37 | 0.81 |
| Offset Disk 12 ft | 105 | 9,400 | 5.56 | 556 | 42.52 | 1.62 | 2.25 | 3.61 | 2.29 | 1.74 | 7.64 | 0.83 |
| Offset Disk 16 ft | 130 | 11,800 | 7.42 | 742 | 51.68 | 1.52 | 2.17 | 3.48 | 2.18 | 1.31 | 6.97 | 0.77 |
| Offset Disk Wing 21 ft | 200 | 16,800 | 9.74 | 974 | 68.49 | 1.75 | 2.35 | 3.72 | 2.32 | 1.00 | 7.03 | 0.90 |
| Tandem Disk 8.75 ft rigid | 40 | 5,400 | 5.41 | 541 | 25.39 | 0.76 | 1.16 | 1.54 | 1.36 | 1.79 | 4.69 | 0.33 |
| Tandem Disk 11ft rigid | 60 | 6,000 | 6.40 | 640 | 29.11 | 0.96 | 1.12 | 1.63 | 1.40 | 1.51 | 4.55 | 0.41 |
| Tandem Disk 15 ft rigid | 105 | 11,000 | 8.73 | 873 | 45.98 | 1.21 | 1.55 | 2.30 | 1.86 | 1.11 | 5.27 | 0.53 |
| Tdm Disk 21 ft fold | 160 | 18,300 | 12.22 | 1,222 | 66.76 | 1.38 | 1.80 | 2.49 | 2.18 | 0.79 | 5.46 | 0.58 |
| Tdm Disk HD 12 ft | 130 | 9,400 | 6.98 | 698 | 49.37 | 1.68 | 2.10 | 3.70 | 1.98 | 1.39 | 7.07 | 0.82 |
| Tdm Disk HD 18 ft fold | 160 | 18,000 | 10.47 | 1,047 | 66.40 | 1.60 | 2.08 | 2.90 | 2.51 | 0.93 | 6.34 | 0.67 |
| Tdm Disk HD 30 ft fold | 360 | 30,500 | 17.45 | 1,745 | 108.73 | 1.85 | 2.11 | 3.16 | 2.52 | 0.56 | 6.23 | 0.91 |

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**Table 2. Tillage Equipment Economic Cost Structure for 2000 (Continued)**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| V-Ripper 25" OC 10 ft | 160 | 10,700 | 6.18 | 618 | 55.19 | 2.29 | 2.72 | 4.92 | 2.44 | 1.57 | 8.93 | 1.14 |
| V-Ripper 25" OC 14 ft | 200 | 13,000 | 8.65 | 865 | 64.24 | 2.02 | 2.30 | 4.18 | 2.12 | 1.12 | 7.42 | 1.02 |
| V-Ripper 25" OC 18 ft | 260 | 16,700 | 11.13 | 1,113 | 75.83 | 1.93 | 2.14 | 3.82 | 2.12 | 0.87 | 6.82 | 1.03 |
| V-Ripper 25" OC 25 ft | 310 | 20,200 | 15.45 | 1,545 | 87.60 | 1.65 | 1.80 | 3.18 | 1.86 | 0.63 | 5.67 | 0.88 |
| V-Ripper 30" OC 12.5 ft | 160 | 8,900 | 7.73 | 773 | 52.83 | 1.76 | 2.05 | 3.93 | 1.65 | 1.25 | 6.84 | 0.91 |
| V-Ripper 30" OC 17 ft | 200 | 11,300 | 10.51 | 1,051 | 62.09 | 1.61 | 1.81 | 3.44 | 1.54 | 0.92 | 5.91 | 0.84 |
| V-Ripper 30" OC 22.5 ft. | 360 | 16,300 | 13.91 | 1,391 | 88.19 | 1.96 | 1.96 | 3.96 | 1.68 | 0.70 | 6.34 | 1.14 |
| Comb Fld Cult Incorp 16 ft | 160 | 16,100 | 11.54 | 1,154 | 63.26 | 1.38 | 1.79 | 2.63 | 2.01 | 0.84 | 5.48 | 0.61 |
| Comb Fld Cult Incorp 23 ft | 200 | 26,500 | 16.59 | 1,659 | 83.96 | 1.32 | 1.74 | 2.18 | 2.30 | 0.58 | 5.06 | 0.53 |
| Comb Fld Cult Incorp 26 ft | 260 | 28,600 | 18.03 | 1,803 | 93.36 | 1.40 | 1.77 | 2.36 | 2.28 | 0.54 | 5.18 | 0.63 |
| Comb Fld Cult Incorp 33 ft | 310 | 36,400 | 23.80 | 2,380 | 111.23 | 1.29 | 1.63 | 2.07 | 2.20 | 0.41 | 4.67 | 0.57 |
| Comb Disk & V-Ripper 12.5 | 225 | 19,500 | 6.44 | 644 | 84.28 | 2.95 | 4.76 | 7.56 | 4.02 | 1.50 | 13.09 | 1.54 |
| Comb Disk & V-Ripper 17.5 | 360 | 25,000 | 9.02 | 902 | 98.22 | 3.07 | 3.71 | 6.11 | 3.71 | 1.07 | 10.89 | 1.76 |
| Disk Fld Cult Finish 13 ft | 130 | 11,900 | 6.70 | 670 | 52.14 | 1.69 | 2.41 | 3.86 | 2.48 | 1.45 | 7.79 | 0.85 |
| Dsk, Fld Cult Finish 22 ft | 200 | 21,400 | 11.33 | 1,133 | 74.88 | 1.60 | 2.27 | 3.19 | 2.56 | 0.86 | 6.61 | 0.78 |
| Dsk, Fld Cult Finish 30 ft | 260 | 28,700 | 15.45 | 1,545 | 90.93 | 1.46 | 2.07 | 2.75 | 2.51 | 0.63 | 5.88 | 0.74 |
| Dsk, Fld Cult Finish 38 ft | 310 | 34,300 | 19.58 | 1,958 | 105.02 | 1.37 | 1.91 | 2.51 | 2.36 | 0.50 | 5.36 | 0.70 |
| Springtooth Drag 30 ft | 60 | 8,200 | 21.64 | 649 | 51.35 | 0.27 | 0.86 | 0.48 | 1.42 | 0.47 | 2.37 | 0.12 |
| Springtooth Drag 48 ft | 75 | 10,400 | 34.62 | 1,212 | 57.59 | 0.21 | 0.59 | 0.36 | 1.01 | 0.30 | 1.66 | 0.10 |
| Springtooth Drag 58 ft | 105 | 12,100 | 41.83 | 4,183 | 46.76 | 0.26 | 0.32 | 0.48 | 0.41 | 0.23 | 1.12 | 0.11 |
| Roller Harrow 12 ft. | 75 | 9,100 | 7.42 | 742 | 34.67 | 0.97 | 1.29 | 1.68 | 1.69 | 1.31 | 4.67 | 0.44 |
| Roller Harrow 28 ft. | 160 | 23,600 | 17.31 | 1,731 | 71.83 | 0.93 | 1.46 | 1.76 | 1.83 | 0.56 | 4.15 | 0.41 |

* See footnotes at end of table 5

**Table 3. Planting Equipment Economic Cost Structure for 2000**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Row Crop Planter 4-36, 12 ft | 40 | 13,500 | 5.60 | 392 | 46.31 | 1.23 | 2.25 | 1.49 | 4.30 | 2.49 | 8.27 | 0.31 |
| Row Crop Planter 6-30, 15 ft | 60 | 17,800 | 7.00 | 490 | 55.93 | 1.33 | 2.31 | 1.49 | 4.51 | 1.99 | 7.99 | 0.38 |
| Row Crop Planter 8-30, 20 ft | 75 | 25,500 | 9.33 | 653 | 71.43 | 1.35 | 2.37 | 1.34 | 4.83 | 1.49 | 7.65 | 0.35 |
| Row Crop Planter 12-30, 30 ft | 105 | 38,700 | 14.00 | 980 | 102.35 | 1.30 | 2.45 | 1.43 | 4.88 | 0.99 | 7.31 | 0.33 |
| Min-Til Planter 4-36, 12 ft | 60 | 20,000 | 5.09 | 356 | 59.64 | 1.96 | 3.48 | 2.05 | 6.93 | 2.73 | 11.72 | 0.52 |
| Min-Til Planter 6-30, 15 ft | 75 | 26,000 | 6.36 | 509 | 68.60 | 2.20 | 3.17 | 1.96 | 6.63 | 2.19 | 10.78 | 0.52 |
| Min-Til Planter 8-30, 20 ft | 105 | 30,900 | 8.48 | 594 | 88.39 | 1.88 | 3.39 | 2.37 | 6.41 | 1.64 | 10.42 | 0.54 |
| Min-Til Planter 12-30, 30 ft | 160 | 53,600 | 12.73 | 1,273 | 122.28 | 2.67 | 2.95 | 2.39 | 6.13 | 1.09 | 9.61 | 0.55 |
| Min-Til Planter 16-30, 40 ft | 200 | 75,800 | 16.97 | 2,206 | 153.69 | 3.37 | 2.46 | 2.13 | 6.10 | 0.82 | 9.06 | 0.52 |
| Potato Planter Filler | | 12,700 | 5.75 | 322 | 27.10 | 0.59 | 1.96 | 0.00 | 4.71 | 0.00 | 4.72 | 0.02 |
| Potato Row Marker 4 row | 130 | 11,900 | 4.98 | 214 | 69.95 | 1.93 | 4.56 | 5.19 | 5.87 | 2.99 | 14.05 | 1.15 |
| Potato Row Marker 6 row | 160 | 18,600 | 7.47 | 321 | 91.00 | 1.65 | 4.34 | 4.07 | 6.12 | 1.99 | 12.18 | 0.94 |
| Potato Row Marker 8 row | 160 | 23,800 | 10.79 | 464 | 103.91 | 1.18 | 3.56 | 2.82 | 5.43 | 1.38 | 9.63 | 0.65 |
| Potato Planter 4 row | 130 | 35,800 | 3.83 | 214 | 125.28 | 4.39 | 10.64 | 6.74 | 19.01 | 6.96 | 32.71 | 1.49 |
| Potato Planter 6 row | 130 | 47,700 | 5.75 | 322 | 149.56 | 3.40 | 8.93 | 4.49 | 16.90 | 4.64 | 26.03 | 1.00 |
| Potato Planter 8 row | 160 | 65,600 | 8.30 | 465 | 190.61 | 3.11 | 8.34 | 3.66 | 16.08 | 3.21 | 22.96 | 0.85 |
| Beet Planter 12 row | 105 | 25,000 | 4.67 | 280 | 83.87 | 2.80 | 5.91 | 4.30 | 10.48 | 3.19 | 17.97 | 0.99 |
| Grain Drill 25 ft | 130 | 25,300 | 10.61 | 848 | 80.46 | 1.62 | 2.33 | 2.43 | 3.90 | 1.26 | 7.59 | 0.54 |
| Grain Drill 30 ft | 130 | 31,900 | 12.73 | 1,018 | 91.06 | 1.53 | 2.26 | 2.03 | 4.08 | 1.05 | 7.15 | 0.45 |
| Grain Drill 35 ft | 160 | 38,500 | 14.85 | 1,188 | 106.23 | 1.60 | 2.35 | 2.05 | 4.21 | 0.90 | 7.15 | 0.47 |

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**Table 3. Planting Equipment Economic Cost Structure for 2000 (Continued)**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Presswheel Drill 12 ft | 75 | 18,500 | 5.09 | 382 | 56.97 | 2.16 | 3.20 | 2.45 | 6.12 | 2.62 | 11.19 | 0.65 |
| Presswheel Drill 16 ft | 105 | 24,000 | 6.79 | 509 | 73.83 | 2.13 | 3.35 | 2.96 | 5.96 | 1.96 | 10.88 | 0.68 |
| Presswheel Drill 20 ft | 130 | 25,800 | 8.48 | 636 | 82.71 | 1.97 | 3.07 | 3.04 | 5.13 | 1.57 | 9.75 | 0.67 |
| Presswheel Drill 30 ft | 160 | 37,900 | 12.73 | 1,018 | 105.21 | 1.86 | 2.71 | 2.39 | 4.83 | 1.05 | 8.27 | 0.55 |
| Presswheel Drill 40 ft | 200 | 49,700 | 16.97 | 1,358 | 130.00 | 1.78 | 2.57 | 2.13 | 4.74 | 0.78 | 7.66 | 0.52 |
| Air Seeder Drill 36 ft | 260 | 58,400 | 15.27 | 1,222 | 150.19 | 2.35 | 3.33 | 2.78 | 6.18 | 0.87 | 9.83 | 0.75 |
| No-Till Drill 15 ft | 130 | 28,000 | 6.36 | 509 | 84.51 | 2.84 | 4.14 | 4.06 | 7.13 | 2.09 | 13.28 | 0.90 |
| No-Till Drill 20 ft | 160 | 40,800 | 8.48 | 679 | 109.68 | 2.90 | 4.28 | 3.58 | 7.77 | 1.57 | 12.93 | 0.83 |
| No-Till Drill 30 ft | 200 | 60,400 | 12.73 | 1,018 | 146.92 | 2.66 | 3.95 | 2.84 | 7.65 | 1.05 | 11.54 | 0.69 |

* See footnotes at end of table 5

**Table 4. Crop Maintenance Equipment Economic Cost Structure for 2000**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | ------- Total Cost / Acre[2/] ------- Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cultivator 4-36, 12 ft | 75 | 3,600 | 6.18 | 618 | 27.23 | 0.97 | 0.97 | 2.02 | 0.79 | 1.60 | 4.40 | 0.53 |
| Cultivator 6-30, 15 ft | 60 | 4,500 | 7.73 | 773 | 26.38 | 0.67 | 0.78 | 1.35 | 0.79 | 1.28 | 3.41 | 0.34 |
| Cultivator 8-30, 20 ft | 130 | 6,100 | 10.30 | 1,030 | 43.96 | 0.97 | 1.20 | 2.51 | 0.80 | 0.96 | 4.27 | 0.56 |
| Cultivator 12-30, 30 ft | 160 | 12,000 | 15.45 | 1,545 | 56.07 | 0.88 | 1.14 | 1.97 | 1.02 | 0.64 | 3.63 | 0.46 |
| Cultivator 16-30, 40 ft | 200 | 14,700 | 20.61 | 2,061 | 65.45 | 0.81 | 1.01 | 1.76 | 0.94 | 0.48 | 3.18 | 0.43 |
| Cultivator Hi Res 4-36, 12 ft | 75 | 6,400 | 6.18 | 618 | 30.80 | 1.07 | 1.22 | 2.02 | 1.37 | 1.60 | 4.98 | 0.53 |
| Cultivator Hi Res 6-30, 15 ft | 105 | 8,700 | 7.73 | 773 | 41.41 | 1.15 | 1.51 | 2.60 | 1.48 | 1.28 | 5.36 | 0.60 |
| Cultivator Hi Res 8-30, 20 ft | 160 | 11,900 | 10.30 | 1,030 | 55.87 | 1.31 | 1.70 | 2.95 | 1.51 | 0.96 | 5.42 | 0.68 |
| Cultivator Hi Res 12-30, 30 ft | 225 | 20,200 | 15.45 | 1,545 | 84.86 | 1.25 | 1.94 | 3.15 | 1.70 | 0.64 | 5.49 | 0.64 |
| Rotary Hoe 15 ft | 75 | 4,000 | 18.55 | 1,855 | 28.08 | 0.34 | 0.35 | 0.67 | 0.31 | 0.53 | 1.51 | 0.18 |
| Rotary Hoe 21 ft | 105 | 6,200 | 25.96 | 2,596 | 38.83 | 0.33 | 0.41 | 0.77 | 0.34 | 0.38 | 1.50 | 0.18 |
| Rotary Hoe 30 ft | 160 | 9,400 | 37.09 | 3,709 | 53.57 | 0.36 | 0.45 | 0.82 | 0.36 | 0.27 | 1.44 | 0.19 |
| Potato Cultivator 4 row, 13 ft | 75 | 4,500 | 5.36 | 778 | 27.30 | 1.27 | 1.07 | 2.32 | 0.92 | 1.84 | 5.09 | 0.62 |
| Potato Cultivator 6 row, 19 ft | 105 | 6,800 | 8.04 | 1,126 | 37.62 | 1.15 | 1.18 | 2.50 | 0.95 | 1.23 | 4.68 | 0.57 |
| Sugar Beef Cult. 12 row, 22 ft | 105 | 10,200 | 5.60 | 336 | 49.80 | 1.46 | 2.90 | 3.59 | 3.54 | 1.76 | 8.89 | 0.83 |
| S-P Boom Sprayer 47 ft | | 54,800 | 25.92 | 2,592 | 100.53 | 1.15 | 1.05 | 0.00 | 3.30 | 0.58 | 3.88 | 0.11 |
| S-P Boom Sprayer 60 ft | | 68,200 | 33.09 | 3,309 | 121.46 | 1.13 | 1.03 | 0.00 | 3.22 | 0.45 | 3.67 | 0.11 |
| Sprayer 30 ft | 40 | 4,500 | 15.36 | 1,229 | 31.64 | 0.32 | 0.38 | 0.54 | 0.54 | 0.98 | 2.06 | 0.11 |
| Boom Sprayer 50 ft | 60 | 5,600 | 25.61 | 2,561 | 34.41 | 0.27 | 0.25 | 0.41 | 0.35 | 0.59 | 1.34 | 0.10 |
| Sprayer Hi Pres 50 ft | 60 | 23,800 | 23.64 | 2,364 | 61.46 | 0.66 | 0.65 | 0.44 | 1.52 | 0.63 | 2.60 | 0.11 |
| Hooded Sprayer 8 row, 20 ft | 40 | 6,300 | 10.24 | 819 | 34.71 | 0.56 | 0.68 | 0.81 | 1.11 | 1.46 | 3.39 | 0.17 |
| Anhydrous Appl. 30 ft | 160 | 18,300 | 12.73 | 509 | 100.50 | 1.65 | 2.65 | 2.39 | 4.51 | 0.99 | 7.90 | 0.55 |
| Fert. Sprd. 4 T., 40 ft | 60 | 9,400 | 23.76 | 713 | 60.28 | 0.38 | 0.80 | 0.44 | 1.57 | 0.53 | 2.54 | 0.11 |
| Corn Stalk Chopper 12 ft | 60 | 8,400 | 4.65 | 465 | 33.19 | 1.49 | 1.90 | 2.24 | 2.65 | 2.25 | 7.13 | 0.57 |
| Potato Shredder 18 ft. | 130 | 12,300 | 6.98 | 698 | 54.47 | 1.82 | 2.41 | 3.70 | 2.61 | 1.50 | 7.80 | 0.82 |
| Stalk Shredder, 20 ft | 130 | 14,400 | 7.76 | 776 | 57.64 | 1.73 | 2.34 | 3.33 | 2.75 | 1.35 | 7.43 | 0.74 |
| Rock Picker 6 ft | 75 | 12,300 | 1.42 | 85 | 54.47 | 8.77 | 12.07 | 8.79 | 21.58 | 8.04 | 38.41 | 2.33 |

* See footnotes at end of table 5

**Table 5. Harvesting Equipment Economic Cost Structure for 2000**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Mower-Conditioner 9 ft | 40 | 13,400 | 4.36 | 349 | 40.18 | 1.26 | 3.14 | 1.91 | 4.90 | 2.39 | 9.21 | 0.40 |
| Rotary Hay Mower 6 ft | 40 | 6,400 | 2.91 | 291 | 28.80 | 2.29 | 2.44 | 2.87 | 3.77 | 3.27 | 9.90 | 0.61 |
| Rotary Mow/Cond. 9 ft | 75 | 15,300 | 6.55 | 524 | 46.43 | 1.18 | 2.48 | 1.90 | 3.67 | 1.52 | 7.09 | 0.50 |
| Hay Rake (Hyd) 9 ft | 40 | 4,700 | 3.49 | 698 | 21.86 | 1.19 | 1.29 | 2.39 | 1.15 | 2.72 | 6.26 | 0.50 |
| Hay Swather-Cond 12 ft | 60 | 22,400 | 5.82 | 465 | 55.84 | 1.46 | 3.68 | 1.79 | 6.17 | 1.63 | 9.60 | 0.45 |
| Swather-Cond 16' self prop | | 64,700 | 7.76 | 621 | 107.30 | 1.04 | 6.67 | 0.00 | 12.61 | 1.22 | 13.83 | 0.40 |
| Grain Swather 18' pull type | 75 | 10,500 | 8.73 | 698 | 38.31 | 0.67 | 1.42 | 1.43 | 1.87 | 1.09 | 4.39 | 0.38 |
| Grain Swather 21' pull type | 75 | 15,500 | 10.18 | 815 | 45.62 | 0.60 | 1.61 | 1.22 | 2.32 | 0.93 | 4.48 | 0.32 |
| Grain Swather 21' self prop | | 47,400 | 10.18 | 815 | 82.83 | 0.68 | 3.72 | 0.00 | 7.20 | 0.93 | 8.14 | 0.30 |
| Hay Baler PTO Twine, 12' swath | 40 | 17,500 | 4.36 | 873 | 40.42 | 2.73 | 1.92 | 1.91 | 4.30 | 3.05 | 9.26 | 0.40 |
| Round Baler 1000 lb, 9' swath | 60 | 18,000 | 3.01 | 603 | 48.19 | 7.12 | 3.00 | 3.46 | 9.03 | 3.50 | 15.99 | 0.88 |
| Round Baler 1500 lb, 12' swath | 60 | 19,200 | 4.02 | 804 | 50.01 | 5.62 | 2.34 | 2.59 | 7.23 | 2.62 | 12.45 | 0.66 |
| Rd Baler/Wrap 1000 lb, | 60 | 20,800 | 3.01 | 603 | 52.39 | 8.01 | 3.28 | 3.46 | 10.43 | 3.50 | 17.39 | 0.88 |
| Lg Rect. Baler 24' swath | 130 | 59,100 | 16.29 | 815 | 170.10 | 0.79 | 5.01 | 1.59 | 8.21 | 0.65 | 10.44 | 0.35 |
| Forage Harvester 2 row 5' | 105 | 24,400 | 1.38 | 138 | 64.77 | 8.28 | 15.84 | 14.57 | 22.75 | 9.66 | 46.98 | 3.35 |
| Forage SP Harvstr 2 row 5' | | 141,700 | 1.70 | 255 | 132.37 | 8.44 | 36.19 | 0.00 | 70.15 | 7.85 | 78.00 | 2.71 |
| Forage SP Harvstr 3 row 7.5' | | 159,300 | 2.55 | 382 | 149.43 | 7.18 | 27.12 | 0.00 | 53.47 | 5.23 | 58.70 | 2.71 |
| Forage SP Harvstr 6 Row, 15' | | 214,200 | 5.09 | 764 | 201.83 | 5.95 | 18.24 | 0.00 | 37.03 | 2.62 | 39.65 | 2.71 |
| Corn Combine Hd 4-36 12' | Sm Comb | 17,700 | 3.36 | 672 | 102.03 | 9.90 | 9.97 | 22.81 | 3.59 | 3.96 | 30.37 | 2.49 |
| Corn Combine Hd 4-30 10' | Sm Comb | 19,400 | 2.80 | 560 | 103.14 | 11.95 | 12.17 | 27.37 | 4.70 | 4.76 | 36.83 | 2.99 |
| Corn Combine Hd 6-30 15' | Md Comb | 23,900 | 4.20 | 840 | 111.52 | 8.75 | 8.82 | 19.51 | 3.87 | 3.17 | 26.55 | 2.30 |
| Corn Combine Hd 8-30 20' | Md Comb | 31,000 | 5.09 | 1,018 | 116.36 | 7.38 | 7.74 | 16.10 | 4.15 | 2.62 | 22.86 | 1.90 |
| Corn Comb. Hd 12-30, 30' | Lg Comb | 47,800 | 7.64 | 1,527 | 144.88 | 6.16 | 6.66 | 12.99 | 4.24 | 1.74 | 18.97 | 1.58 |

(Continued on next page)

**Table 5. Harvesting Equipment Economic Cost Structure for 2000 (Continued)**

| Machine | Tractor Size (HP) | Net Cost of the New Implement | -- Estimated -- Work Performed Ac/hr | Ac/yr | Total Cost / Hour[1/] | Operating Expense / Acre[3/] | Depreciation / Acre | Total Cost / Acre[2/] Equipment Tractor | +Machine | Labor +Charge | Total = Dollars | Diesel Fuel Gal/acre |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Grain Combine Head 15 ft | Sm Comb | 9,500 | 5.09 | 1,018 | 96.47 | 6.35 | 6.05 | 15.06 | 1.28 | 2.62 | 18.95 | 1.64 |
| Grain Combine Head 20 ft | Md Comb | 10,000 | 6.79 | 1,358 | 102.11 | 5.18 | 4.78 | 12.07 | 1.01 | 1.96 | 15.04 | 1.43 |
| Grain Combine Head 30 ft | Lg Comb | 18,000 | 10.18 | 2,036 | 124.74 | 4.28 | 4.03 | 9.74 | 1.20 | 1.31 | 12.25 | 1.19 |
| Soybean Combine Hd Sm 13' | Sm Comb | 12,800 | 3.86 | 772 | 98.70 | 8.47 | 8.26 | 19.85 | 2.26 | 3.45 | 25.57 | 2.17 |
| Soybean Combine Hd Md 15' | Md Comb | 13,600 | 4.45 | 891 | 104.53 | 7.98 | 7.55 | 18.39 | 2.08 | 2.99 | 23.47 | 2.17 |
| Soybean Combine Hd Lg 18' | Lg Comb | 14,900 | 5.35 | 1,069 | 122.68 | 8.08 | 7.48 | 18.55 | 1.91 | 2.49 | 22.95 | 2.26 |
| Soybean Combine Hd Lg 25' | Lg Comb | 17,600 | 7.42 | 1,485 | 124.50 | 5.86 | 5.50 | 13.36 | 1.62 | 1.79 | 16.77 | 1.63 |
| Potato Windrower 2 row | 75 | 31,000 | 1.49 | 149 | 64.41 | 8.15 | 15.95 | 8.35 | 27.90 | 6.87 | 43.12 | 2.21 |
| Potato Windrower 4 row | 105 | 67,900 | 2.99 | 299 | 120.86 | 7.46 | 16.82 | 6.72 | 30.30 | 3.43 | 40.45 | 1.55 |
| Potato Harvester Seed 2R | 130 | 65,500 | 1.38 | 295 | 118.09 | 20.85 | 20.12 | 18.73 | 38.81 | 28.10 | 85.64 | 4.15 |
| Potato Harvester Seed 4R | 130 | 103,600 | 2.76 | 590 | 149.06 | 14.68 | 14.03 | 9.36 | 30.63 | 14.05 | 54.05 | 2.07 |
| Potato Harvester 2 row | 130 | 53,600 | 1.84 | 294 | 115.83 | 12.66 | 16.06 | 14.05 | 27.88 | 21.08 | 63.00 | 3.11 |
| Disk Bean Top Cutter 6 Row | 105 | 12,800 | 6.40 | 512 | 53.78 | 1.51 | 2.59 | 3.14 | 3.18 | 2.08 | 8.40 | 0.72 |
| Sugar Beet Lifter 4 row | 105 | 46,600 | 3.47 | 277 | 126.63 | 10.69 | 12.18 | 5.80 | 26.91 | 3.84 | 36.55 | 1.33 |
| Sugar Beet Lifter 6 row | 130 | 60,800 | 5.20 | 426 | 159.13 | 9.28 | 10.38 | 4.97 | 23.07 | 2.56 | 30.60 | 1.10 |
| Sugar Beet Topper 6 row | 75 | 18,500 | 5.33 | 427 | 55.58 | 2.02 | 3.38 | 2.34 | 5.83 | 2.25 | 10.42 | 0.62 |
| Sugar Beet Topper 12 row | 160 | 35,700 | 10.67 | 853 | 102.32 | 2.03 | 3.56 | 2.85 | 5.62 | 1.13 | 9.59 | 0.66 |
| Sugar Beet Wagon 8 Ton | 75 | 9,900 | 3.47 | 277 | 38.13 | 2.08 | 3.35 | 3.60 | 4.66 | 2.74 | 11.00 | 0.95 |
| Sugar Beet Wagon 20 Ton | 200 | 39,300 | 5.20 | 520 | 97.74 | 4.24 | 7.09 | 6.96 | 10.01 | 1.83 | 18.80 | 1.69 |
| Sugar Beet Wagon 24 Ton | 225 | 41,600 | 5.20 | 520 | 113.23 | 4.58 | 8.54 | 9.36 | 10.59 | 1.83 | 21.78 | 1.90 |
| 1 Ton Hay Stacker | 60 | 22,800 | 4.15 | 829 | 48.06 | 3.83 | 2.53 | 2.51 | 5.86 | 3.21 | 11.59 | 0.64 |
| 3 Ton Hay Stacker | 75 | 33,700 | 4.84 | 1,064 | 61.37 | 4.93 | 2.78 | 2.58 | 7.36 | 2.75 | 12.69 | 0.68 |
| 6 Ton Hay Stacker | 105 | 54,400 | 5.53 | 1,548 | 91.41 | 7.88 | 3.40 | 3.63 | 10.49 | 2.41 | 16.54 | 0.84 |

1) Total cost per hour is calculated as yearly depreciation, interest, insurance, housing and repairs, divided by hours used per year. Implement and power unit costs are summed. Fuel, lubricants, and labor are added to the total.
2) Total cost per acre is total cost per hour divided by acres per hour. Includes operating expenses, labor, and overhead costs. Including depreciation.
3) Total cost/acre columns include operating expenses as well as overhead costs. Operating expenses are also shown separately. Operating expenses include fuel, lubricants, repairs and maintenance, but not labor. Labor is listed separately.

**Table 6. Miscellaneous Equipment Economic Cost Structure for 1999**
**Per Hour Calculations Only**

| Machine | Tractor Size (HP) | Net Cost Of the New Implement | Estimated Work-Performed Hours/ Year | Operating Expense / Hour | Deprec-iation / Hour | Total Cost / Hour | Diesel Fuel Gal/Hour |
|---|---|---|---|---|---|---|---|
| Rd Bale Wrapper Silage | 60 | 17,900 | 150 | 17.81 | 10.83 | 46.64 | 2.6 |
| Bale Wrapper Dry Hay, 9ft Swath | 40 | 7,700 | 150 | 8.79 | 6.17 | 29.40 | 1.8 |
| Large Forage Blower | 60 | 5,400 | 50 | 5.00 | 10.13 | 32.67 | 2.6 |
| Manure Spreader 150 Bu | 75 | 6,500 | 100 | 9.94 | 7.63 | 33.95 | 3.3 |
| Manure Spreader 300 Bu | 105 | 8,600 | 100 | 13.23 | 11.63 | 45.37 | 4.6 |
| Manure Spreader 400 Bu | 130 | 12,700 | 100 | 17.97 | 16.02 | 58.50 | 5.7 |
| Liquid Manure Spreader 9500 Gal | 225 Tracked | 40,000 | 70 | 41.66 | 55.57 | 155.02 | 9.9 |
| Gravity Grain Box 185 Bu | 60 | 2,500 | 130 | 4.72 | 4.68 | 23.11 | 2.6 |
| Gravity Grain Box 240 Bu | 75 | 4,000 | 130 | 6.10 | 5.90 | 26.79 | 3.3 |
| Baled Hay Wagon | 40 | 3,200 | 250 | 3.84 | 3.80 | 29.92 | 1.8 |
| Forage Wagon 14 ft. | 40 | 10,800 | 130 | 5.41 | 8.12 | 29.83 | 1.8 |
| Forage Wagon 16 ft. | 40 | 12,100 | 130 | 5.71 | 8.74 | 31.08 | 1.8 |
| Soil scraper bucket, 12 cu yd | 260 | 34,300 | 80 | 22.72 | 38.39 | 107.19 | 11.4 |